REGION 4
ATLANTA, GA 30303

October 23, 2025

Mr. Matthew Baker, SRS Remedial Project Manager
Remediation and Deactivation & Decommissioning Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

EPA comments: BIENNIAL EFFECTIVENESS MONITORING REPORT (EMR) FOR MONITORED NATURAL ATTENUATION (MNA) AT THE C-AREA BURNING/RUBBLE PIT (131-C) AND OLD C-AREA BURNING/RUBBLE PIT (NBN) OPERABLE UNIT (U), JANUARY 2023 THROUGH DECEMBER 2024, SEMS NUMBER: 31, SRNS-RP-2025-00608, REVISION 0, JUNE 2025

Dear Mr. Baker,

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the Biennial EMR MNA for CBRP 131-C and NBN for C Area, June 24, 2025. EPA's comments are below.

If you have any questions or require additional information, please contact me at (404) 431-1340.

Sincerely,

JON RICHARDS Digitally signed by JON RICHARDS
Date: 2025.10.23 12:50:18 -04'00'

Jon Richards
FFA Remedial Project Manager
Superfund & Emergency Management Division

ec: C.L. Bergren, SRNS-ACP
Susan Fulmer, SCDHEC

GENERAL COMMENTS

1. The EMR discusses an uncontaminated area between the southwest boundary of the C-Area Burning/Rubble Pit (CBRP) plume and the C-Area Groundwater (CAGW) Operable Unit (OU) plume, but the monitoring wells used to characterize this area are screened in the Upper Aquifer Zone (UAZ) (i.e., well CRP 6DR is screened from 47.3 to 67.3 feet below ground surface [ft bgs] and CRP 8D is screened from 35 to 55 ft bgs). The trichloroethylene (TCE) contamination noted at the CRW 10 well cluster is in the Lower Aquifer Zone (LAZ) (i.e., CRW 10C is screened from 111.6 to 117.3 ft bgs and CRW010CU is screened from 90 to 100 ft bgs). Since a strong downward gradient is noted at the source area, it is unclear if contamination may be found in the LAZ between the CBRP plume and the CRW 10 well cluster. In addition, there appears to be a data gap in the TCE plume in the LAZ, as there are no wells located between the CRPB plume wells (i.e., CRP 18C) and the CRW 10 well cluster (see Appendix D, Figure D-2, 2023 TCE Concentrations in the Middle/Lower Aquifer Zone [MAZ] of the Upper Three Runs Aquifer [UTRA]). Therefore, LAZ wells CRW010CU and CRW 10C and Gordon Aquifer (GA) well CRW 10A cannot be replaced by UAZ wells CRP 6DR and CRP 8D as boundary wells in the CBRP monitoring well network as recommended in Section 5 (Summary). *Please revise the text to discuss the delineation of the TCE plume in the MAZ and LAZ, including the uncontaminated area between the CBRP and CAGW plumes. Please also remove the recommendation to replace LAZ/GA wells CRW010CU, CRW 10C, and CRW 10A with UAZ wells CRP 6DR and CRP 8D as boundary wells to delineate the plume.*

2. The EMR presents inconsistent information for the vertical flow of the TCE plume. Section 4.2 (Groundwater Monitoring Well Network) and Section 4.6.7 (MNA [Monitored Natural Attenuation] Summary) state that the conceptual site model (CSM) predicts there will be higher concentrations of TCE in the lower wells and higher concentrations of degradation products in the upper wells due to biodegradation occurring as the TCE groundwater plume discharges upward to surface water. However, Section 4.3 (Groundwater Elevation Measurements and Groundwater Flow Direction) discusses downward gradients across the majority of the plume, including slight downward vertical gradients in the distal portion of the plume, with occasional reversals such as the one at MNA monitoring stations CRP 48A and B. Section 4.6.7 identifies station CRP 45 as the only MNA monitoring point where the lower well (i.e., CRP 45B) has a lower TCE concentration, which correlates to the downward gradient; however, this correlation suggests that the other stations with downward gradients (i.e., except CRP 48A and B) should also show this reversal in TCE concentrations. Further, while degradation products are noted in the wells located along the Twin Lakes and Four Mile Branch (see Figure 5, Station VOCs Concentrations Above Detection Limit Pie Chart 4Q24), only one MNA monitoring station has higher cis-1,2-dichloroethylene (DCE) in the upper well (i.e., CRP 45A in 2024), and it is unclear if TCE is flowing downward where biodegradation does not occur based on the downward gradients. *Please revise the EMR to discuss the vertical flow of contaminants in the plume with respect to the current downward gradients determined for the monitoring wells and how this impacts the CSM.*

3. The EMR does not provide a figure that reports all detections of site constituents of concern (COCs). Although Appendix D (TCE Plume Maps) depicts the TCE plumes for different aquifer zones, it would be useful to also include a figure depicting all COC detections in support of the CSM. In addition, it is unclear why plume maps for cis-1,2-DCE and vinyl chloride (VC) are not provided to show where there are exceedances of degradation products to illustrate where degradation is occurring. Although Figure 5 (Station VOCs Concentrations Above Detection Limit Pie Chart 4Q24) shows percentages of COCs at each well, plume maps of the degradation products for each aquifer zone should be provided to support the CSM. *Please revise the EMR to include a figure with*

all detections of COCs and plume maps for degradation products in each aquifer zone to support the CSM.

4. It is unclear whether any monitoring wells have been analyzed for emerging contaminant, 1,4-dioxane. 1,4-dioxane was used as a solvent stabilizer and is frequently associated with TCE; as such, any site with significant TCE releases should also be analyzed for 1,4-dioxane. Section 4.4 (Groundwater and Surface Water Compliance) indicates well samples are analyzed for seven constituents, including 1,1-dichloroethylene (1,1-DCE), cis-1,2-DCE, trans-1,2-dichloroethylene (trans-1,2-DCE), VC, tetrachloroethylene (PCE), TCE, and dichloromethane (DCM); however, the text does not indicate whether 1,4-dioxane has been investigated. 1,4-Dioxane can pose an unacceptable human health risk at certain concentrations, is recalcitrant, difficult to remediate and will likely remain after TCE has been remediated. *Please clarify whether the site has been investigated for 1,4-dioxane.*

SPECIFIC COMMENTS

1. **Section 2.2, Land Use Control Boundary and Monitoring Network, Page 4 of 48:** This section indicates that the 30-acre land use control (LUC) boundary is based on the groundwater that exceeded the maximum contaminant level (MCL); however, the text should clarify whether this LUC boundary includes the contaminated surface and vadose zone soils or if there is a separate LUC boundary that restricts on-site worker access and unauthorized contact to surface and vadose zone soils. In addition, the text states that groundwater use restrictions will be enforced as long as groundwater contaminant levels exceed MCLs, but the other LUC objectives listed in Section 2.1 (Remedial Action Requirements and Objectives) are not discussed. For example, it is unclear how it is ensured that the integrity of the soil cover is maintained. *Please revise this section to discuss the LUC boundary for all LUC objectives (i.e., for soils, the monitoring systems, surface water, and indoor air).*

2. **Section 4.6.1, Trichloroethylene, Page 11 of 48:** The text discusses the continuation of the long-term decline in TCE concentrations at upgradient well CRP-18D, but Figure C-136 (Time Series Plot for Trichloroethylene [TCE] Station for CRP 18) shows that the TCE concentration increased in 2024 compared to recent values. *Please revise the text to discuss this increase as shown on Figure C-136.*

3. **Section 4.6.7, MNA Summary, Pages 22 to 24 of 48:** This section does not discuss the results of the MNA parameters in the MNA monitoring stations (e.g., dissolved oxygen [DO], oxidation reduction potential [ORP], pH, and alkalinity). Based on Appendix A Table A-1 (CBRP OU Monitoring Results), many of the MNA stations have DO, ORP, and pH values that are greater than the conditions considered to be favorable for biodegradation (i.e., DO should be <0.5 milligrams/liter, ORP should be <50 millivolts, and pH should be within an optimal range of 6 to 8 or the potential range of 5 to 9). *Please revise the text to summarize the results of MNA parameters, including a discussion of the ranges of MNA parameter monitoring results and any MNA monitoring wells that fall within optimal ranges to evaluate MNA efficacy at the site.*

4. **Section 5, Summary, Page 24 of 48:** The first sentence states that annual inspection and maintenance of the low permeability soil cover will continue, but the EMR does not indicate where the results of these annual inspections are reported. It is unclear if any maintenance actions were necessary during the reporting period (i.e., in 2023 and 2024). *Please revise the EMR to include a brief summary of any inspection and maintenance activities that took place during the monitoring period or include a reference to where these results can be found.*

5. **Appendix A, CBRP OU Analytical Data 2023-2024, Page A-3 to A-4 of A-6:** Some of the data in this table are illegible. For example, the results for trichloroethylene are too blurry and not legible. *Please revise this table to ensure all of the data are legible.*